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AN E-COMMERCE SITE GENERATOR

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A Project  
Presented to the  
Faculty of  
California State University,  
San Bernardino

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science  
in  
Computer Science

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by  
Younik Lee  
December 2000

AN E-COMMERCE SITE GENERATOR


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Presented to the  
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by  
Younik Lee  
December 2000


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## ABSTRACT

The e-commerce site generator called "CARTSHARE" is a software application that provides Web-based user tools to conduct e-business over the Internet. The purpose of this software is to provide an affordable and accessible environment for small businesses to conduct e-commerce in a simple manner.

CARTSHARE allows users to create multiple online shopping stores from a Web browser interface. By sharing the resources required for e-business, CARTSHARE minimizes the cost of building an e-commerce site.

Sharing resources, such as a server machine, database, merchant account and shopping-cart software eliminates a significant amount of fees and effort to create and maintain an e-business. For this reason, CARTSHARE provides an affordable e-commerce solution to small businesses or individuals, who want to sell products without a high initial overhead. The only resources required to create an online business through CARTSHARE are a web browser and an Internet connection. It does not require any software installation or programming skills.

The CARTSHARE system was designed using the object-oriented concept and was implemented in Java Servlet.



Using Java Servlet, which is a new and efficient server-side application development API, the CARTSHARE software provides platform independence and extensibility for further development. This system also supports two different database management systems (MYSQL [11] and ORACLE [12]) and uses a connection pooling mechanism [5] to increase the performance of database connection.

Using CARTSHARE, users can easily create an online store, maintain a product catalog and control transactions using the Web.

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## CHAPTER 1 : SOFTWARE REQUIREMENT SPECIFICATION

### 1.1 Introduction

With the advent of the Internet, anyone with access to a computer, or an "Internet appliance", is able to perform tasks electronically that affect many aspects of his/her life. People all over are now being offered the infinite possibilities of a wired world. One of the most promising is "e-business".

"e-business" is the conduct of business over the Internet including not only buying and selling, but also customer service, and collaboration with business partners [4].

E-business promotes a new way of doing business. Via dedicated intranets and extranets, consumers and suppliers can access product specifications, place orders, check order details, track shipments, send and receive confirmations and updates, even provide after-sale service -- everything necessary to complete a transaction.

Finally, e-business is eliminating the need for more "brick-and-mortar" stores, reduces infrastructure costs, and improves inventory efficiency. The potential market for the e-commerce is beyond imagination.



Currently, most major corporations have already expanded their businesses to take advantages of the Internet. Companies are using the Web to provide product information, sell products to customers, buy parts and supplies from other companies, and advertise themselves.

Today, even small companies are rethinking their business strategies in terms of the Internet. However, starting an e-business requires advanced computer knowledge and skills, also the purchase of expensive software and hardware. Even though there are several Websites and software packages that provide a way of starting an e-business, the initial cost of starting such business is too high for most small businesses.

Currently there are several Websites allowing users to build their online stores like Yahoo Store Builder [15], CNET Store [2], EasyCart [6] and others. They provide elegant and easy ways to create online stores. One of the disadvantages of the above tools is the cost of maintaining the store, which is typically paid by a monthly fee regardless of the amount of transactions made from the store, even if no purchase order was placed. They also require users to provide extra resources like their own merchant accounts and online credit card processing.

This means every online store is required to have its own cashier.

With the CARTSHARE system, one cashier takes care of transactions for all the stores in the shopping mall, which minimizes the cost of store maintenance.

CARTSHARE provides the mechanism for creating an online store, which becomes part of an online shopping mall. This means that users can shop for products provided from all the stores within the mall or shop only at the store that they like. CARTSHARE even provides product search, which allows users to find specific products from the catalog of all stores.

CARTSHARE was designed to provide an online storefront solution that adds e-commerce functionality while greatly reducing the overhead.

The main idea of this system is the sharing of resources like the server machine, shopping cart software, merchant account, database and also a common catalog.

CARTSHARE provides an affordable e-commerce solution to many small business owners, who want to sell product through the Internet with minimal setup efforts and maintenance costs.

This project documentation describes the design, development and evaluation of the CARTSHARE software.

## 1.2 Product Overview and Summary

The software product CARTSHARE is designed to provide a Web-based user interface tool that creates and maintains multiple online stores in a simply way. CARTSHARE creates an online store based on data provided by a would-be storeowner through the user-friendly GUI (Graphical User Interface) of Internet browsers.

The main idea of the CARTSHARET system is the sharing of resources required to carry on e-business. It aims to provide an affordable e-commerce solution to small businesses while sharing resources like the server machine, shopping-cart software and merchant account to minimize the cost of building an online store. Each of these resources is shared by multiple stores within the CARTSHARE system. In addition, each store's product information is retrieved from a common product catalog, from which user can directly find a product without visiting every store.

CARTSHARE is written in Java, especially in Java Servlet API, which increases the performance of Web applications, compared to traditional CGI script. With a

Java Virtual Machine, Servlet is loaded once when it is called, and it is not loaded again until the Servlet program is modified [3].

CARTSHARE supports multiple database management systems and uses a Connection Pooling mechanism [5] which is critical to database intensive applications like CARTSHARE, to optimize the database transaction processing. It creates a pool of reusable database connections to be embedded by the application component as needed. Once the user-specified number of connections are established, an application doesn't have to reopen the connection anymore, which reduces the database connection time.

The CARTSHARE Store Builder creates a new online store with the provided user information. A directory with the store name is created, and all related files are placed under this directory for organizational and security purposes.

The CARTSHARE Store Manager provides an easy way to manage the product information stored in the database. It allows a store owner to add, delete and modify product information in the product catalog. It also allows the

store owner to control transactions and modify store information.

The Store Manager is only available to store owners of CARTSHARE via Store ID and password.

CARTSHARE supports file upload from a Web browser. From the HTML form, the product image file can be easily transferred to a designated directory.

The CARTSHARE system has a text configuration file, which includes database information, the store directory, the error log location, etc. This file can be edited using any text editor to configure the CARTSHARE system.

CARTSHARE's own error log functionality allows the system administrator to find internal Web server errors, which are caused by programming exceptions.

#### 1.2.1 Perspective of Store Owner

The prospective store owner can build online store from *store builder*, which can be reached from the main web page. From the store builder interface, the prospective owner provides store information (store name, store description and store password) and owner information (email, name and address). After submitting the information, the store owner selects the logo image file from owner's local computer and uploads it.

Once the store is created, the store owner logs in to *store manager* giving the store name and password. Using the store manager, the store owner accesses the product catalog, the transaction report and the store account. To add a product, the store owner provides the product name, price, image file and description. Each product can be modified or deleted from the product catalog, which contains a list of all the products. When a customer places a purchase order, the store owner can create a transaction report or search the transaction by providing starting and ending dates. From the account page, the owner updates the account information (password, description, email and address) and the store logo image.

#### 1.2.2 Perspective of Customer

A customer signs up once for membership in order to purchase products from any store within the CARTSHARE system. Once a user account is created, the customer provides user name (email) and a password to proceed to make purchases at any time. A customer has three starting points to begin shopping (shop by category, shop by store and product search). By selecting one of shopping categories, a customer can see product list within the specified category from all stores. Otherwise, if a

customer likes or trusts in a particular store, a customer limits shopping within the store, which he/she prefers. Finally a customer finds a product using a search engine, which is available on every shopping page. Providing a product keyword, all related products will appeared in the search result.

Once a customer finds the desired product, he/she simply adds it to the shopping cart. The shopping cart is not owned by any particular store. It allows the customer to buy products from several different stores within CARTSHARE at the same time.

After a purchase is made, the order status is updated the order history page and the purchase receipt with the order number is emailed to the customer. Whenever a customer places an order, a store review can be written. Store reviews will help other customers to rate each store within CARTSHARE. A customer can also request to have the forgotten password retrieved by providing his/her email address.

### 1.3 Technologies

#### 1.3.1 Java Servlet

Servlet, a java class, is a generic server extension that can be loaded dynamically to expand the functionality

of a server. CGI has been the standard for developing interactive Web sites [14]. Servlet is an alternative solution to CGI, providing better performance [10].

Unlike CGI, which creates a separate process for each request, Servlet starts a new thread with each request within one Web server process. With Servlet, a server doesn't have to create and initialize a new address space for every client's request [9].

Servlets are server-side applications that run within the Web server, which means that they do not require support for the Java-enabled Web browser to execute Servlets [1].

### 1.3.2 Database Connection Pooling

Database connection pooling is a mechanism, reduces the overhead time for establishing the database connection from a database intensive application. The database connection time consists of locating a database server, establishing a communication channel and authenticating with the database user's name and password through the database management system [10].

To reduce the overhead time, a pool of reusable connections is created and managed by a connection broker application, which is available from Java Exchange [5].



The connection broker reuses a collection of pre-established Database connections from the pool to avoid the overhead needed to connect to a database.

### 1.3.3 Session Tracking

Session tracking is a flexible and lightweight mechanism for maintaining the current state of a single user's sequential requests. The stateless HTTP protocol does not have the capability to recognizing that a sequence of requests is from the same client [1].

To create software like a shopping cart, maintaining a state for each transaction is crucial. The application should keep track of what each user does from the browser. With the built-in Java Session Tracking API, the server maintains the state through the use of cookies or through URL rewriting during the time period [10].

A cookie is a small piece of information sent to the client's browser and can be retrieved later by the server to identify the client. Whenever a browser refuses to accept a cookie, the session tracker uses a URL rewriting method, in which every URL link will be rewritten to include extra information like unique session ID to maintain the state and user's identity.

## 1.4 Development, Operating, and Maintenance Environments

### 1.4.1 Development Environment

CARTSHARE uses the following hardware and software on the server. Clients can use a standard Web browser such as Netscape Navigator or Internet Explorer to access it.

1.A PC (Personal Computer) with Redhat Linux 6.1 specifically

- a. 200 Mhz Pentium
- b. 3.4 GB hard disk
- c. 128 MB RAM
- d. Linux Kernel v2.2.14

2. JDK Development Kit 1.2.2

3. TWZ JDBC Driver for MySQL

4. Thin JDBC Driver for Oracle

5. MySQL-3.22.32-1

6. Oracle8i 8.1.5

7. Apache Server 1.3

8. ApacheJserv 1.1-2

### 1.4.2 Operating Environment

The product shall operate within the environment as specified above in section 1.4.1

### 1.4.3 Maintenance Environment

The product shall be maintained within the environment as specified above in section 1.4.1

## 1.5 Graphical User Interface (GUI)

CARTSHARE GUI offers an easy way for creating an online store from a Web browser. This section describes each of the GUI that CARTSHARE provides.

### 1.5.1 General Layout

The menu for the storeowner is displayed at the Store Manger site. Interaction with the Store Manager is done by simple clicks on hyperlinks. The menu consists of three categories and eight site links. Each page link allows the store owner to move on to other Store Manager utilities of interest. The utilities that each hyperlink allows the store owner to access are in the category of *Product, Transaction and Account*.

The menu for the shopper, which includes each *shop category, store list, user account, shopping cart, order status, customer service and password retrieval*, is displayed at store home site and part of above utilities can be found in every shopping site as needed.

The search box is shown on every shopping site and enables users to find a product using keyword(s). The product search is done through the SQL query.

The description of the utilities for the storeowner is found in the following sections.

Table 1. User Inputs and Corresponding Actions for Store Owner

User Input	Result
Click the Add a Product link	Display Product Addition page
Click the Modify a Product link	Display the Modify a Product link
Click the Delete a Product link	Display the Delete a Product link
Click the All Transaction link	Display All Transaction report page
Click the New Transaction link	Display New Transaction report page
Click the Search Transaction link	Display Transaction search page
Click the Store Update link	Display store information page
Click the Add Store Logo link	Display Add Store Logo page

The description of these utilities for the shopper is found in the following sections.

Table 2. User Inputs and Corresponding Actions for Customer

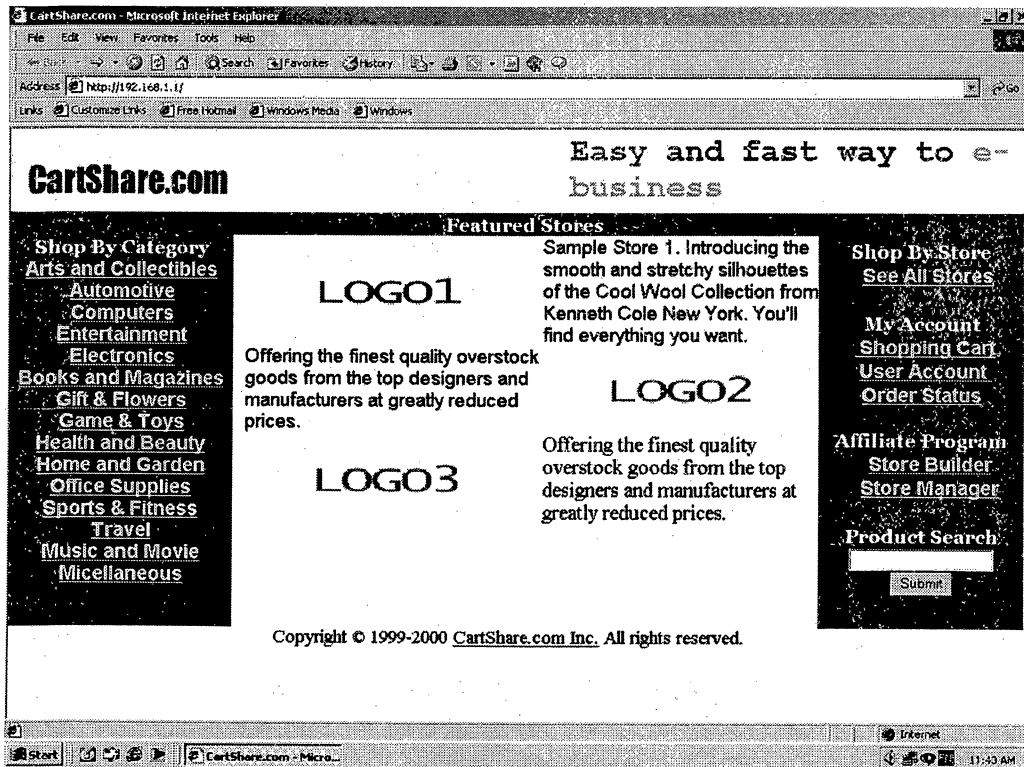
User Input	Result
Click the Shop Category link	Display Product list page in specified category
Click the See All Store link	Display Store list page
Click the Shopping Cart link	Display Shopping cart page
Click the New Member link	Display New Member Signup Page

Click the User Account link	Display User Account login page
Click the Order Status link	Display Order Status login page
Type keyword in Search box and Click submit button	Display product list found with provided keyword
Click the Customer Service link	Display Customer Service page
Click the Forgot Password link	Display Password retrieval page

### 1.5.2 Home

Home is a main web page of the CARTSHARE system, which allows customers to start shopping by store or by category, or find a product with the search box. This page also provides links for storeowner to create a new store or login to store manager

Figure 1. Home



### 1.5.3 Store Builder

This page allows a new user to create a new store by providing store and owner information. Before a store is created, the name of store will be verified with existing store names. The name of store should be unique and cannot be changed once created. New user must provide a unique store name and description, as well as personal information such as email address, real name and valid address as owner information.

Figure 2. Store Builder

The screenshot shows a web browser window titled "CartShare.com - Microsoft Internet Explorer". The address bar displays "http://192.168.1.1/". The page content includes the "CartShare.com" logo and the tagline "Easy and fast way to e-business". A prominent button labeled "Create My Store" is centered. Below this, a heading states "Fill out this form and you can create your own store right now." The form is divided into two columns: "Store Information" and "Owner Information". The "Store Information" column contains fields for "Store Name", "Password", and a large "Description" text area. The "Owner Information" column contains fields for "Email Address", "First Name", "Last Name", "Address" (with a sub-field), "City", "State", and "Zip code". A "Create a Store" button is located at the bottom of the form. A copyright notice at the bottom of the page reads "Copyright © 1999-2000 CartShare.com Inc. All rights reserved." The Windows taskbar at the bottom shows the Start button, several open applications (Adobe Photoshop, Figures - Microsoft Word, figure), and the system clock indicating 1:52 PM.

Store Information	Owner Information
Store Name <input type="text"/>	Email Address <input type="text"/>
Password <input type="text"/>	First Name <input type="text"/>
Description <input type="text"/>	Last Name <input type="text"/>
	Address <input type="text"/>
	<input type="text"/>
	City <input type="text"/>
	State <input type="text"/>
	Zip code <input type="text"/>

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#### 1.5.4 Store Manager Login

Click on Store Manager link allows the storeowner to see the following page (Figure 3). On this page, storeowner can login to store manger with valid store name and password. After password validation, storeowner can access store information.

Figure 3. Store Manager Login

The screenshot shows a Microsoft Internet Explorer window with the title 'CartShare.com - Microsoft Internet Explorer'. The address bar displays 'http://192.168.1.1/'. The page content includes the 'CartShare.com' logo and the tagline 'Easy and fast way to e-business'. A section titled 'Store Manager Login' contains the instruction: 'If you already created your store, please login with your store name and password. you can control your store here.' Below this is a 'Store Information' section with input fields for 'Store Name' and 'Password', and a 'LOGIN' button. At the bottom, a copyright notice reads 'Copyright © 1999-2000 CartShare.com Inc. All rights reserved.' The taskbar at the bottom shows the Start button and several open applications: 'CartShare.com - Micro...', 'Adobe Photoshop', and 'Images - Microsoft Word'. The system clock indicates '11:57 AM'.

CartShare.com Easy and fast way to e-business

**Store Manager Login**

If you already created your store, please login with your store name and password. you can control your store here.

**Store Information**

Store Name

Password

LOGIN

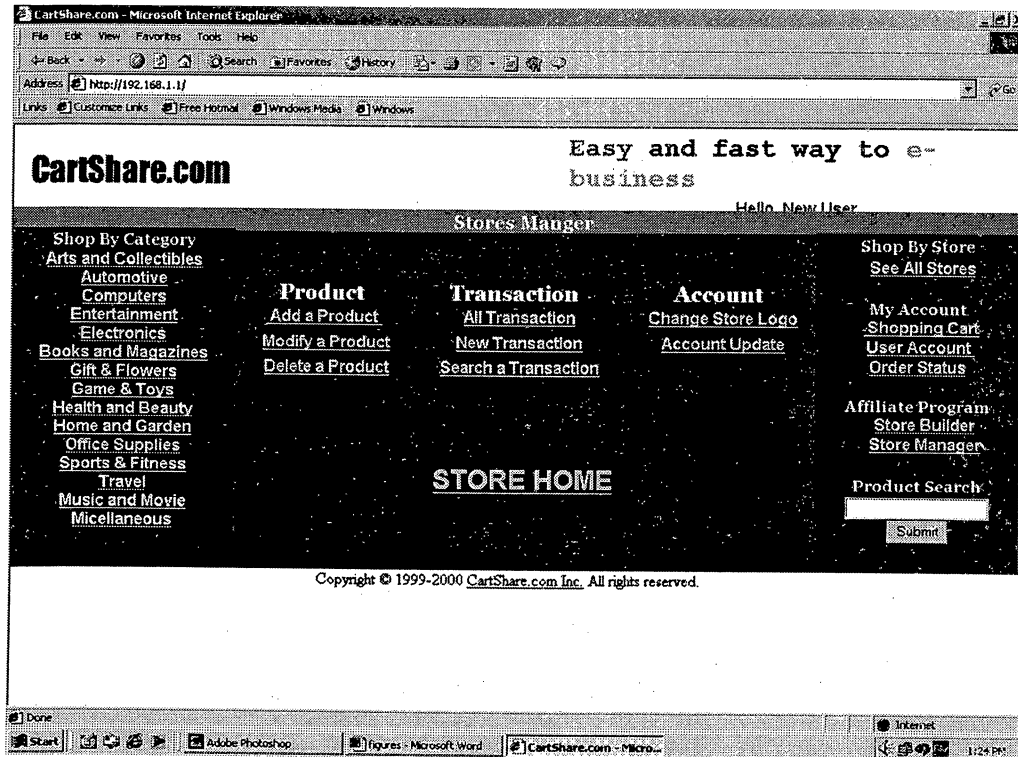
Copyright © 1999-2000 CartShare.com Inc. All rights reserved.

#### 1.5.5 Store Manager Menu

This page allows the store owner to control store properties. There are three categories including product, transaction and account. Each category has submenu links to do a specific job.



Figure 4. Store Manger Menu



#### 1.5.6 Product Addition

This page allows the storeowner to add a new product into the store including product category, name of product, price, description and image. A product id will be assigned automatically from the product table.

Figure 5. Product Addition

The screenshot shows a web browser window titled "CartShare.com - Microsoft Internet Explorer". The address bar displays "http://192.168.1.1/". The page header includes the "CartShare.com" logo and the tagline "Easy and fast way to e-business". A navigation menu contains links: "Main Menu", "New Product", "Update Product", "Store Home", "Report", and "Account". A user greeting "Hello, New User" is visible. The main content area contains a form for adding a new product, with instructions: "Enter your new item including category, price, image file and description here. If you already have same item in your store, check product list and update / delete the item." The form fields are: "Category" (a dropdown menu labeled "Select a Category"), "Product Name" (a text input field), "Price" (a text input field), "Image File" (a text input field with a "Browse..." button), and "Description" (a large text area). An "Add a Product" button is located at the bottom of the form. The Windows taskbar at the bottom shows the Start button, a clock at 1:25 PM, and several open applications: Adobe Photoshop, Figures - Microsoft Word, and CartShare.com - Micro...

#### 1.5.7 Product List

This page lists all product information of the store: product id, product name, price and images. From this page, storeowner can see two links for product deletion and product modification.

Figure 6. Product List

**CartShare.com** Easy and fast way to e-business

**Product Lists**

PID	Product	Category	Price	Image		
1	Dell 1440	Computers	\$1,020.78	/mystore/compag.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>
2	IBM1440 AMD A1232	Computers	\$1,030.78	/mystore/compag.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>
3	PING 200	Sports & Fitness	\$300.56	/mystore/ping.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>
4	JAVA : HOW-TO	Books & Magazines	\$59.99	/mystore/java.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>
5	C++ : HOW-TO	Books & Magazines	\$59.99	/mystore/c++.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>
6	9-band radar detector	Automotives	\$120.78	/mystore/radar.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>
7	BEL 950/VECTOR	Electronics	\$121.78	/mystore/radar2.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>
8	Las Vegas	Travel	\$200.23	/mystore/travel.gif	<a href="#">Modify</a>	<a href="#">Delete</a>
9	solitaire diamond	Arts & Collectibles	\$1,001.10	/mystore/art.jpg	<a href="#">Modify</a>	<a href="#">Delete</a>

#### 1.5.8 Product Modification

This page allows storeowner to modify product information including product category, name of product, price, description and image.

Figure 7. Product Modification

The screenshot shows a web browser window titled 'CartShare.com - Microsoft Internet Explorer'. The address bar shows 'http://192.168.1.1/'. The page header includes 'CartShare.com' and the tagline 'Easy and fast way to e-business'. The main heading is 'Modify a product'. The form contains the following fields:

- Category:** A dropdown menu with 'Select Category'.
- Product Name:** A text input field containing 'Dell 1440'.
- Price:** A text input field containing '1020.78'.
- Image File:** A text input field containing 'H:\project\html\poweredby.gif' with a 'Browse...' button.
- Description:** A text area containing the text: 'The Compaq Presario 7594 is the Internet PC that helps you get more out of life. Equipped with an Intel?Celeron? processor, you have the muscle you need to explore the Internet, enjoy games and run p'.

Below the form is a 'Modify Product' button. At the bottom of the page is a copyright notice: 'Copyright © 1999-2000 CartShare.com Inc. All rights reserved.' and a navigation bar with links: 'MAIN / ADD / TRANSACTION / STORE'. The Windows taskbar at the bottom shows several open applications: 'Start', 'Internet', 'Adobe Photoshop', 'H:\project\html\poweredby.gif', 'H:\project\html\poweredby.gif', 'H:\project\html\poweredby.gif', and 'CartShare.com - Microsoft Internet Explorer'.

#### 1.5.9 Store Logo Update

This page allows the storeowner to modify the store logo image, which was provided when the store was created. A logo image file, which is selected from the local machine, is uploaded using the HTML form.

Figure 8. Store Logo Update

The screenshot shows a web browser window titled 'CartShare.com - Microsoft Internet Explorer'. The address bar displays 'http://192.168.1.1/'. The page content includes the 'CartShare.com' logo and the tagline 'Easy and fast way to e-business'. A section titled 'Add / Change Store Logo Image' contains instructions: 'Use this form to add or change the logo image of your store. Click the browser button and select the image you want to transfer.' Below this is a form with a 'Logo Image File' label, a text input field, and a 'Browse...' button. At the bottom of the form are two buttons: 'Post Logo' and 'Clear Form'. A copyright notice at the bottom of the page reads 'Copyright © 1999-2000 CartShare.com Inc. All rights reserved.' The Windows taskbar at the bottom shows the Start button, several icons, and open applications including 'Adobe Photoshop', 'Figures - Microsoft Word', and 'Figure'.

#### 1.5.10 Transaction Search

This page allows storeowner to select a range of transaction date to be displayed and status of order processing, which can be new, complete or pending.

Figure 9. Transaction Search

CartShare.com - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address: http://192.168.1.1/

Links: Customize Links Free Hotmail Windows Media Windows

**CartShare.com** Easy and fast way to e-business

**Transaction Report**

Transaction Summary			
<b>From</b>	January	01	2000
<b>To</b>	January	01	2000
<b>Status</b>	Select Order Status		
<input type="button" value="Generate"/>			

Copyright © 1999-2000 CartShare.com Inc. All rights reserved.

Done Start Adobe Photoshop Figures - Microsoft Word Figure CartShare.com - Micro... 1:30 PM

#### 1.5.11 Transaction Report

This page allows the storeowner to see new purchase orders and complete transactions by changing the status of the orders. By clicking the User Email link, the browser will load a pop up window showing the user's shipping address. The storeowner can find the information of the product purchased by clicking on the Product ID column. The order status can be managed from the order status column.

Figure 10. Transaction Report

CartShare.com Easy and fast way to e-business						
Purchase Order						
order date	order #	Buyer Email	PID	QT	Shipping	status
2000-07-25	13	ylee@ovillage.com	12	2	Next Day Delivery	Complete
2000-07-25	15	ylee@ovillage.com	13	2	Next Day Delivery	On Order
2000-07-26	24	ylee@ovillage.com	6	2	Next Day Delivery	On Order
2000-07-26	16	ylee@ovillage.com	11	2	Next Day Delivery	Pending
2000-07-26	17	ylee@ovillage.com	11	2	Next Day Delivery	On Order
2000-07-26	18	ylee@ovillage.com	11	2	Next Day Delivery	On Order
2000-07-26	19	ylee@ovillage.com	11	2	Next Day Delivery	On Order
2000-07-26	20	ylee@ovillage.com	12	2	Next Day Delivery	On Order

#### 1.5.12 Store Update

This page allows the storeowner to update store and owner information. Current information is displayed first and storeowner can modify information with valid password. The store name cannot be changed at any time.

Figure 11. Store Update

CartShare.com - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://192.168.1.1/

Links Customizer Links Free Hotmail Windows Media Windows

**CartShare.com** Easy and fast way to e-business

**Update My Store Info**

Store Information	Owner Information
<b>Store Name</b> mystore	<b>Email Address</b> yase@avillage.com
<b>Old Password</b>	<b>First Name</b> younik
<b>New Password</b>	<b>Last Name</b> lee
<b>Description</b> Offering the finest quality overstock goods from the top designers and manufacturers at greatly reduced prices.	<b>Address</b> 26322 Towne
	n/a
	<b>City</b> Irvine
	<b>State</b> CA
	<b>Zip code</b> 92610
<b>Update Store Info</b>	

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Done Start Adobe Photoshop Figures - Microsoft Word Figure CartShare.com - Micro... Internet 1:32 PM

#### 1.5.13 New Customer Signup

This page allows a new customer to signup with user information, which will be stored in database for future use. Once the signup process has completed, customer is not required to provide any further information to purchase a product.

User selected password and credit card information will be stored into database with encryption for security reason.



Figure 12. New Customer Signup

The screenshot shows a web browser window titled "CarlShare.com - Microsoft Internet Explorer". The address bar displays "http://192.168.1.1/". The page header includes the CarlShare.com logo and the tagline "Easy and fast way to e-business". A navigation bar contains links for "New Member", "Account Info", "Order Status", and "Customer service". The main form is divided into three sections: "User ID and Password", "Billing & Shipping Information", and "Payment Method".

**User ID and Password:**

- Email:
- Password:
- Verify Password:

**Billing & Shipping Information:**

- First Name:  Last Name:
- Address:
- City:  State:
- Zip Code:
- Phone:

**Payment Method:**

- Credit Card Number:  Expiration Date:  Month:  Year:
- Credit Card Type:
- Sign Up Now:

The taskbar at the bottom shows the Start button and several open applications: Adobe Photoshop, Figures - Microsoft Word, and a folder named Home. The system clock indicates 1:36 PM.

#### 1.5.14 Order History

This page allows the customer to see the order history and check the status of a specific order.

Figure 13. Order History

CartShare.com - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://192.168.1.1/

Links Customize Links Free Hotmail Windows Media Windows

**CartShare.com** Easy and fast way to e-business

Hello New User

**Order History**

order date	order #	Product	QT	Seller	Shipping	status
2000-07-25	15	Honda civic LX	2	mystore	Next Day Delivery	On Order
2000-07-26	16	Linksys EtherFast	2	mystore	Next Day Delivery	Pending
2000-07-26	17	Linksys EtherFast	2	mystore	Next Day Delivery	On Order
2000-07-26	18	Linksys EtherFast	2	mystore	Next Day Delivery	On Order
2000-07-26	19	Linksys EtherFast	2	mystore	Next Day Delivery	On Order
2000-07-26	20	VACHETTA SMALL	2	mystore	Next Day Delivery	On Order
2000-07-26	21	VACHETTA SMALL	2	mystore	Next Day Delivery	On Order
2000-07-26	22	VACHETTA SMALL	2	mystore	Next Day Delivery	On Order
2000-07-26	23	Dell AUX 1000	1	mystore	Next Day Delivery	On Order
2000-07-26	24	9-band radar detector	2	mystore	Next Day Delivery	On Order
2000-08-03	25	VACHETTA SMALL	1	mystore	Next Day Delivery	On Order
2000-08-03	26	VACHETTA SMALL	1	mystore	Next Day Delivery	On Order
2000-08-04	27	VACHETTA SMALL	2	mystore	Next Day Delivery	On Order
2000-08-04	28	solitaire diamond	1	mystore	Standard Delivery	On Order
2000-08-04	29	VACHETTA SMALL	1	mystore	Standard Delivery	On Order
2000-08-04	30	VACHETTA SMALL	2	mystore	Next Day Delivery	On Order

Done Start Adobe Photoshop Figures - Microsoft Word Figure CartShare.com - Micro... 1:35 PM

#### 1.5.15 Customer Service Request

This page allows customer to submit a customer service claim regarding any problem found with a purchased product. The customer must provide email, password, order number and a detailed description of the problem. Provided information will be forwarded to the store owner who sold that product.

Figure 14. Customer Service Request

The screenshot shows a web browser window titled "CartShare.com - Microsoft Internet Explorer". The address bar displays "http://192.168.1.1/". The page header includes the "CartShare.com" logo and the tagline "Easy and fast way to e-business". A navigation bar contains links for "New Member", "Account Info", "Order Status", and "Customer Service". The main content area is titled "Enter a detailed description of problem to request a customer service. This information will be mailed to your seller and be contacted immediately." Below this, there are input fields for "User Email", "Password", and "Order Number". A large text area labeled "Description" is provided for the user to enter details. A "Request" button is located below the description field. At the bottom of the form, there is a link for "Have you forgotten your Password? Or Are you New member?" and a copyright notice: "Copyright © 1999-2000 CartShare.com Inc. All rights reserved." The browser's taskbar at the bottom shows the Start button and several open applications: Adobe Photoshop, Figures - Microsoft Word, and Figures.

CartShare.com Easy and fast way to e-business

[New Member](#) | [Account Info](#) | [Order Status](#) | [Customer Service](#)

Enter a detailed description of problem to request a customer service. This information will be mailed to your seller and be contacted immediately.

User Email

Password

Order Number

Description

[Have you forgotten your Password? Or Are you New member ?](#)

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#### 1.5.16 Customer Account Update

This page allows the customer to update user information. Current information is displayed first without password and credit card information for security reasons and customer can modify information at any time.

Figure 15. Customer Account Update

CartShare.com - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://192.168.1.1/

Links Customise Links Free HTML Windows Media Windows

**CartShare.com** Easy and fast way to e-business

Hello, New User

**Account Information**

**User ID and Password**

Email lylee@ovillage.com

Password

Verify Password

**Billing & Shipping Information**

First Name younik Last Name lee

Address 26322 town

City Irvine State CA

Zip Code 92711

Phone 909-111-2222

**Payment Method**

Credit Card Number Expiration Date Month Year

Credit Card Type VISA

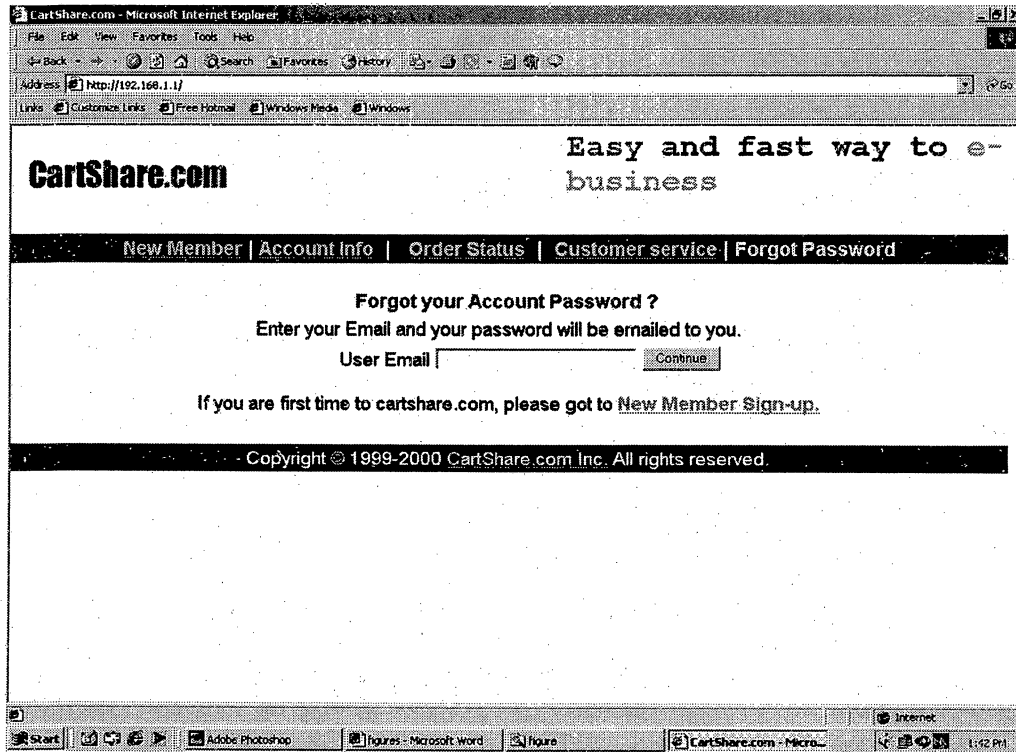
Update

Done Start Adobe Photoshop figures - Microsoft Word figure CartShare.com - Micro... 1:41 PM

#### 1.5.17 Password Retrieval

On this page, a customer who has forgotten his/her password can receive the password by email.

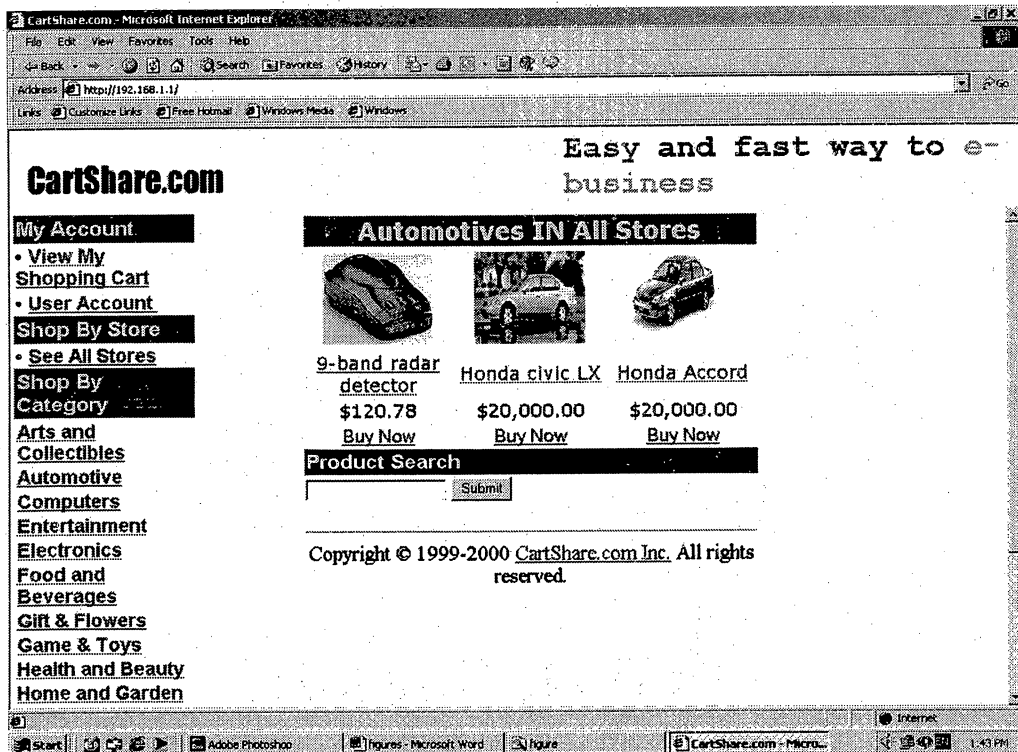
Figure 16. Password Retrieval



#### 1.5.18 Shop By Category

By clicking on any of product category from the mall homepage, the browser will load the following page. This page provides a list of products from all stores in the same category that customer select.

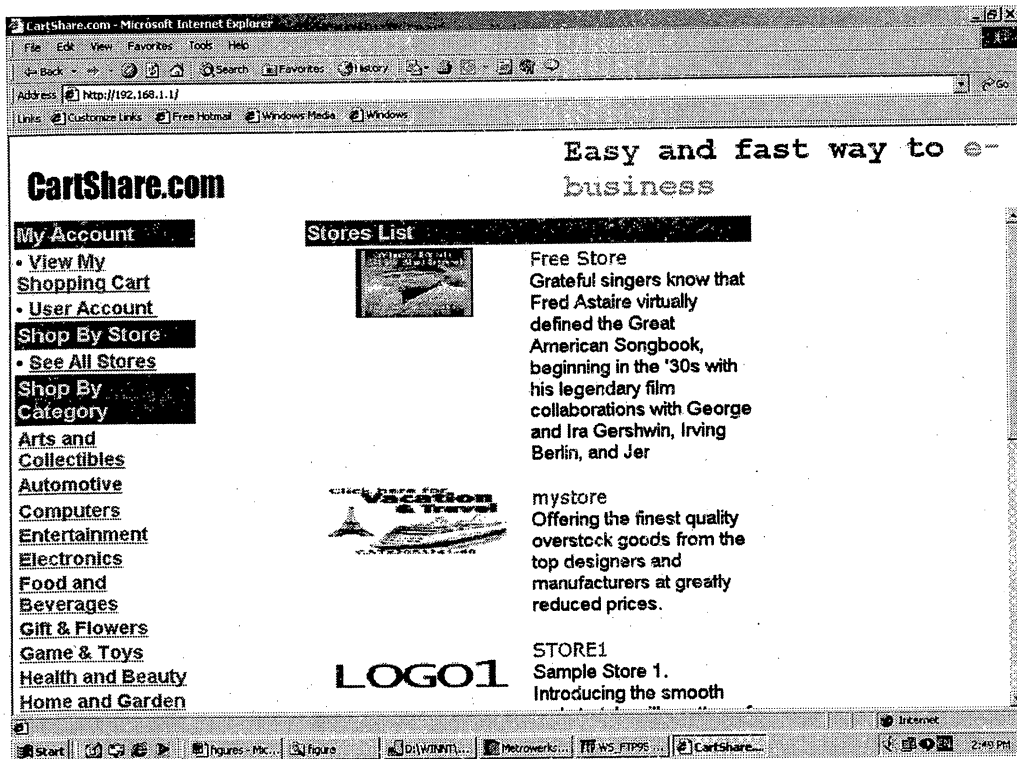
Figure 17. Shop By Category



#### 1.5.19 Shop By Store

By clicking on "all store" link, the browser will load the following page. This page provides a list of all stores registered in the CARTSHARE System. From this page, the customer browses through all the stores and select one to shop.

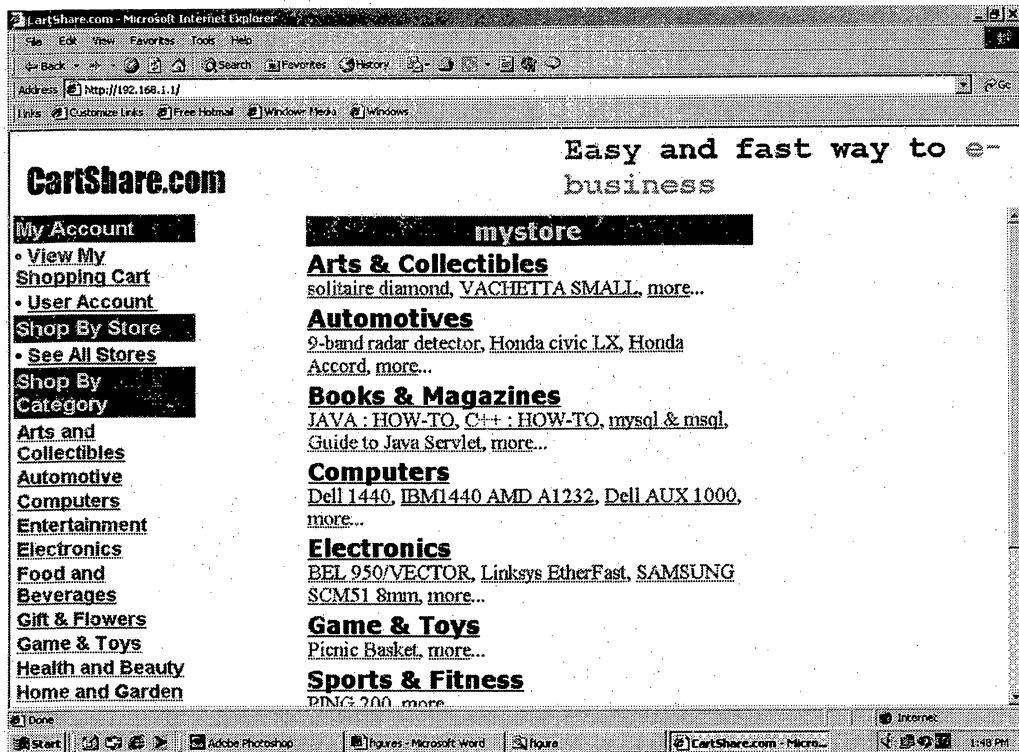
Figure 18. Shop By Store



### 1.5.20 Store

By clicking on the name of store, the browser will load the following page. This page provides all categories and randomly selected products available within the specific store.

Figure 19. Store

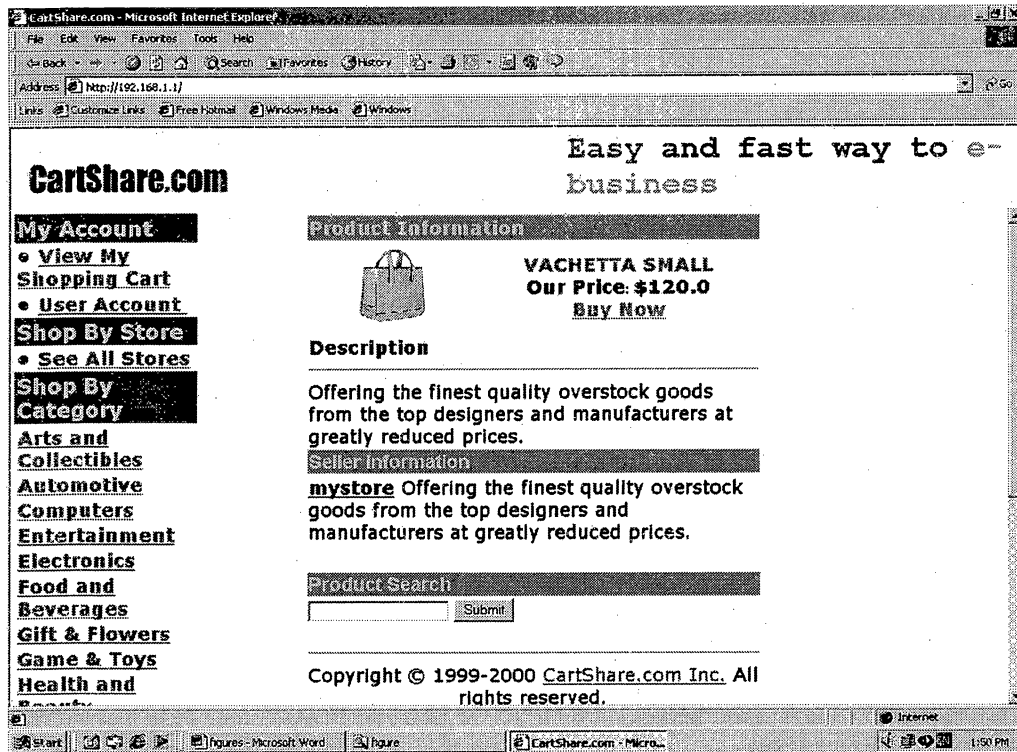


#### 1.5.21 Product Information

By clicking on any of product link, the browser will load the following page. This page provides detailed product information including description and seller information. The customer can obtain further information about the product via email by clicking the store name link.



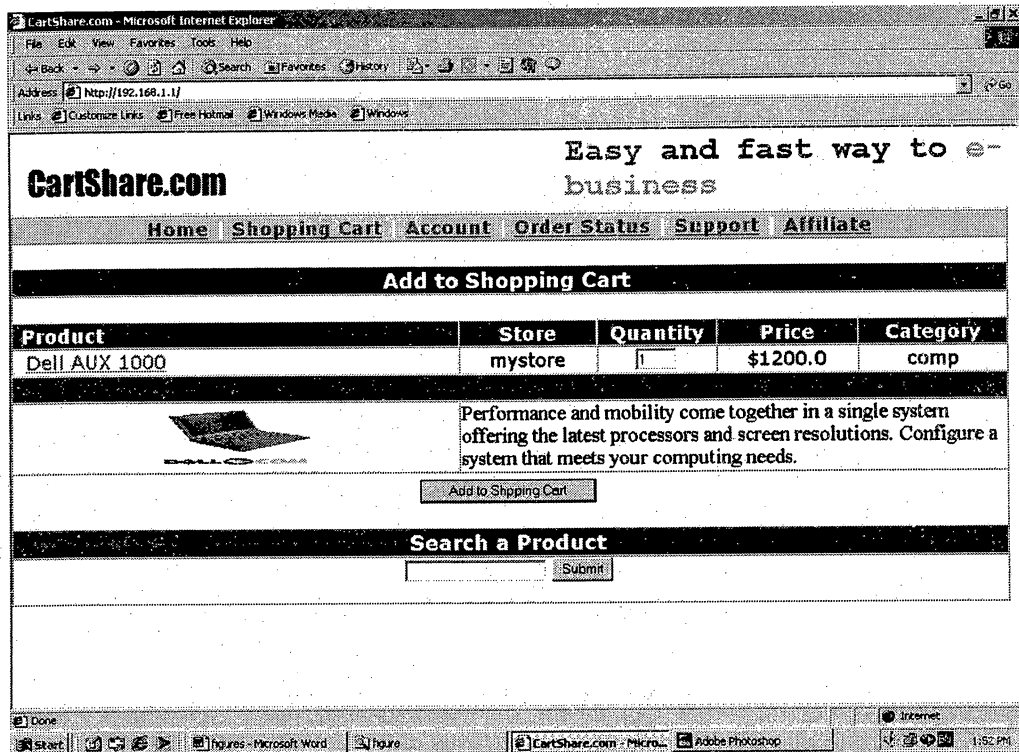
Figure 20. Product Information



#### 1.5.22 Add To Shopping Cart

By clicking on any of the "buy now" link, selected product can be put into the shopping cart. From the shopping cart page, customer can remove or update items in the shopping cart.

Figure 21. Add To Shopping Cart



### 1.5.23 Shopping Cart

This page allows customer to verify or update content of shopping cart and then proceed to the check out process with items in the shopping cart. Customer must select a shipping method and provide user id, which is the same as user email address, and password. Customer can purchase items from different stores and Shipping fee will be charged per item.

Figure 22. Shopping Cart

**CartShare.com** Easy and fast way to business

### 1. My Shopping Cart

Product	Store	Quantity	Price	Total
VACHETTA SMALL	mystore	2	\$120.00	\$240.00
Dell AUX 1000	mystore	1	\$1,200.00	\$1,200.00
<b>Total</b>				<b>\$1,440.00</b>

[Update Quantity](#) [Continue Shopping](#)

### 2. Proceed to Checkout

Email Address

Password

Select Shipping Method : Standard Shipping \$3.25 \* 2 (# of Items)

[Checkout](#)

\* Have you forgotten your Password? Or Are you New member ?

#### 1.5.24 Order Confirmation

This page allows customer to make sure whether the shipping address, shipping fee, applicable taxes and items to be purchased are correct. By clicking on complete button, Purchase order will be confirmed and customer can see an order receipt. After order was confirmed, customer can find the list of order from the order status page.

Figure 23. Order Confirmation

CartShare.com - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://192.168.1.1/

Links Customize Links Free HTML Windows Media Windows

**CartShare.com** Easy and fast way to e-business

Product ID	Product	Store	Quantity	Price	Total
12	VACHETTA SMALL	mystore	2	\$120.00	\$240.00
15	Deil AUX 1000	mystore	1	\$1,200.00	\$1,200.00
					Sub Total : \$1,440.00
					Shipping & Handling : \$13.00
					Sales Tax : \$112.61
					<b>Total Due : \$1,565.61</b>

**Billing & Shipping Information**

Email ylee@ovillage.com

First Name younik Last Name lee

Address 26322 townes

City Irvine State CA

Zip Code 11111

Phone 000-000-0000

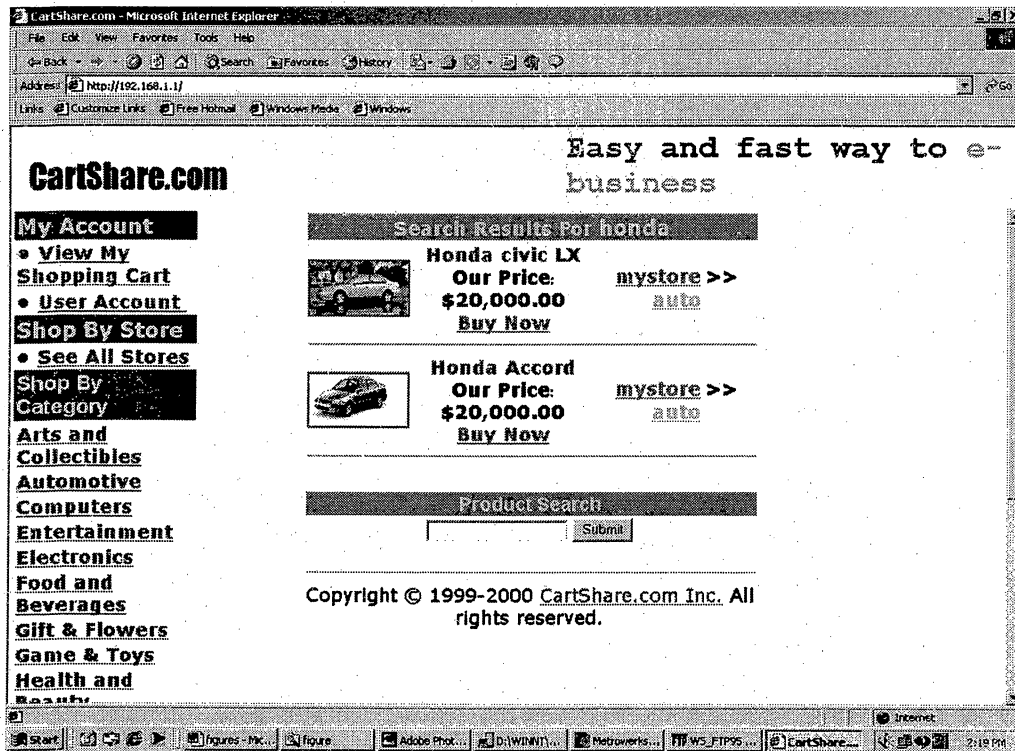
Done Start Internet

hours - Microsoft Word hours CartShare.com - Micro Adobe Photoshop 1:54 PM

#### 1.5.25 Product Search Result

Product search box can be found in every shop page, which allows customer to find a product with product keyword. The following page displays a sample search result.

Figure 24. Product Search Result



#### 1.5.26 Change Order Status

This page allows the storeowner to change the status of placed order, which can be either "On Order", "Complete" or "Pending".

Figure 25. Change Order Status

**Change Order Status**

Use this form to chage order status.

**On Order** : Store owner has received order but hasn't process the order yet.  
**Complete** : Store owner has sent the ordered items.  
**Pending** : Store owner can't process this order with some reasons.

order date	order #	Buyer Email	Seller	status	
2000-07-25	13	yilee@ovillage.com	mystore	Pending	<input type="button" value="Change"/>

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#### 1.5.27 Write Store Review

This page allows customers to write an opinion about a store they have dealt with. For privacy, the writer's identity is not shown to other customers, but is only available to the system administrator. Only registered customers can rate stores and place comments. The range of rating score is -5 to 5.

Figure 26. Write Store Review

CartShare.com - Microsoft Internet Explorer

Back Forward Stop Search Favorites History

File Edit View Favorites Tools Help

Address http://24.16.71.231/

Y Ticker Quotes Charts News Ranch Add To My Portfolio Markets Yi Bookmarks Sign Out

**CartShare.com** Easy and fast way to e-business

**Write a Store Review**

Write your review of this product and let other customers know what you think about the store. Only registered customer can place a review.

User Email

Password

Store Name

Rating

Your Review

Have you forgotten your Password? Or Are you New member?

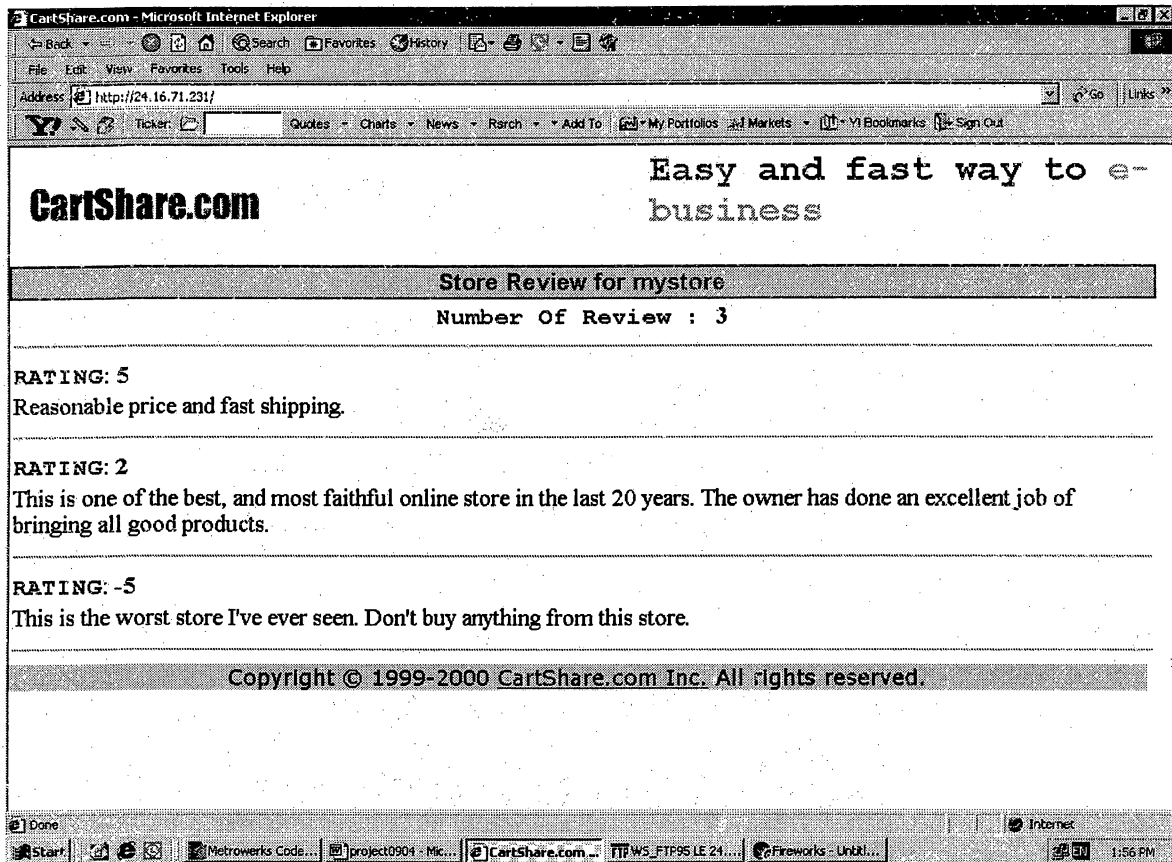
Copyright © 1999-2000 CartShare.com Inc. All rights reserved.

Done Start Metrowerks Code project0904 - PK... CartShare.com HTTP WS\_FTP99 LT 24... Fireworks - Untal... Internet 2:01 PM

#### 1.5.28 Show Store Review

Clicking on any store review link, and the following page will be displayed. This page displays store reviews, which were placed by registered customers. This page will help customers make intelligent and better informed purchase online.

Figure 27. Show Store Review



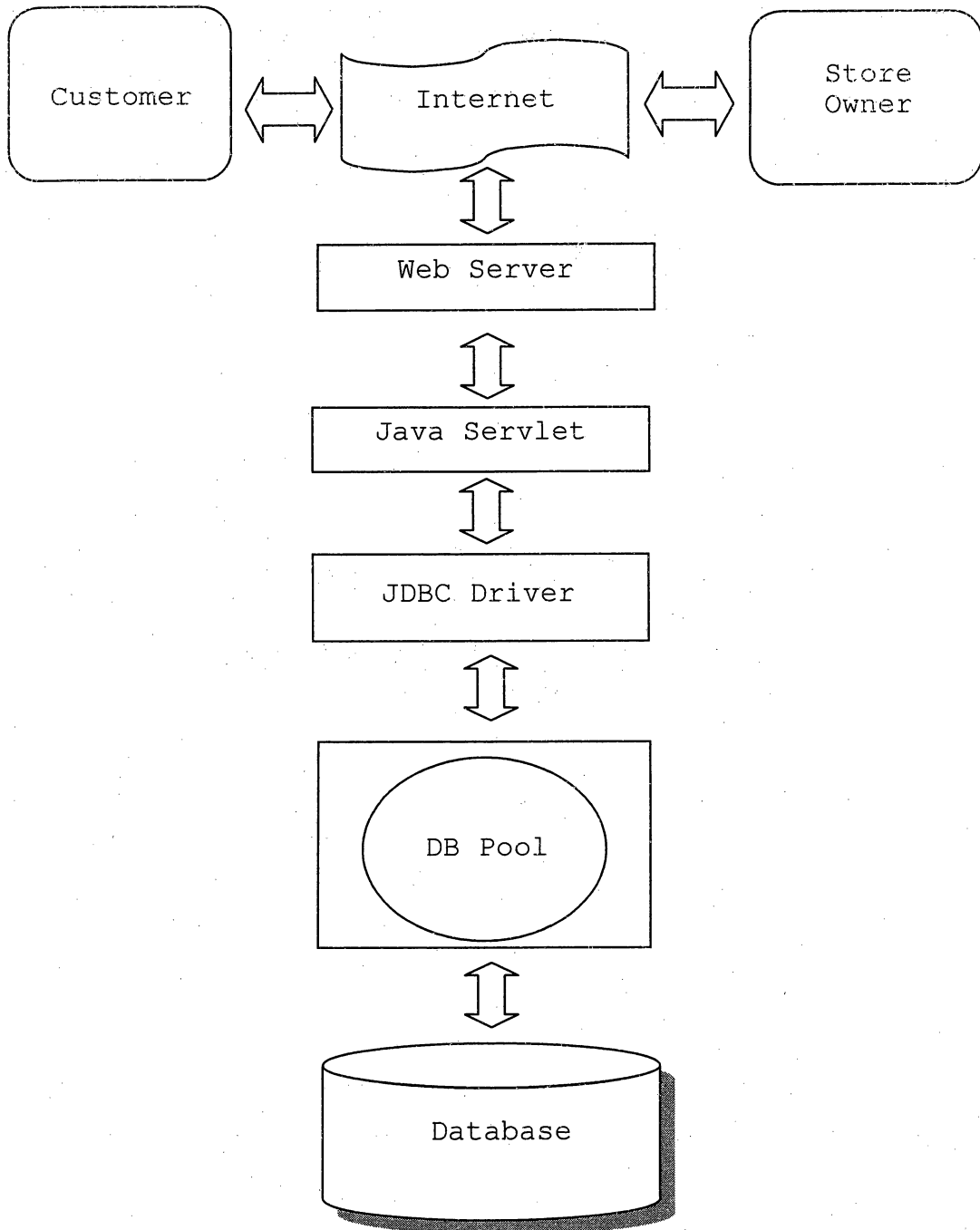
## 1.6 Functional Requirements

The CARTSHARE operational structures and their requirements are described in this section.

### 1.6.1 Overall Schema



Figure 28. Overall Schema



### 1.6.2 State Diagram

The following is the state diagram of CARTSHARE Store Manager functions

Figure 29. State Diagram for Store Manager

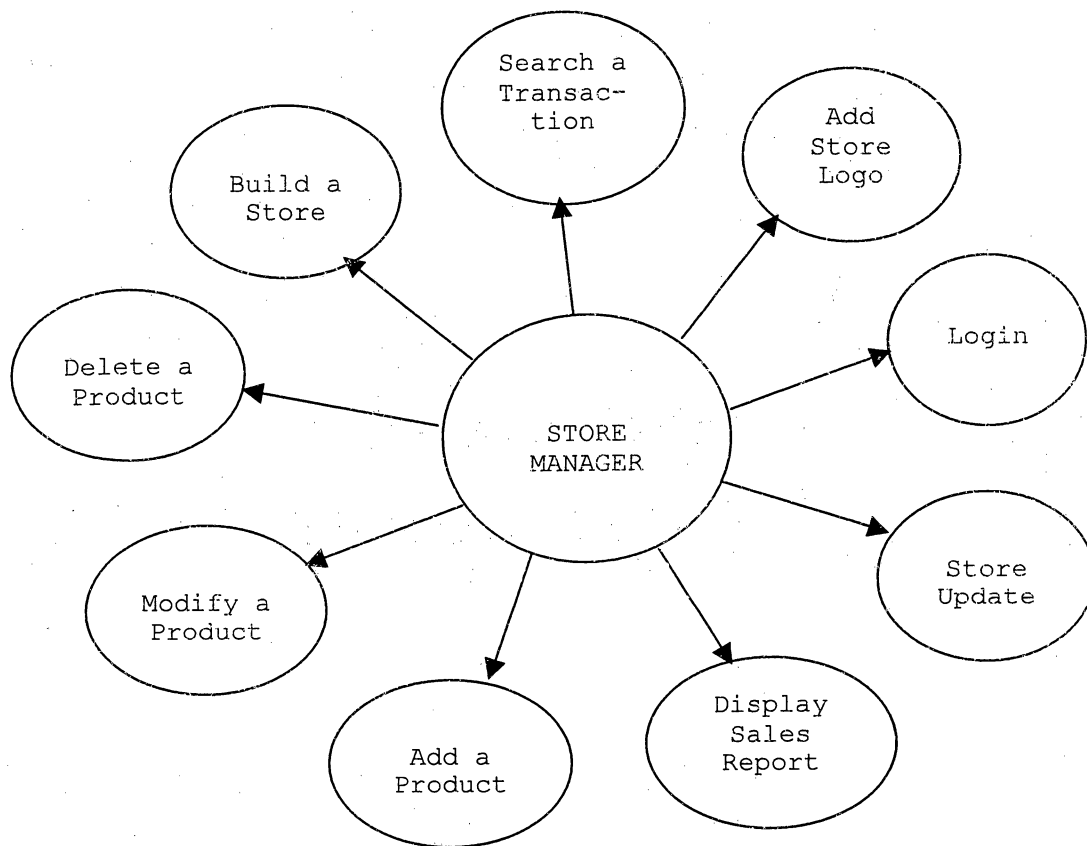
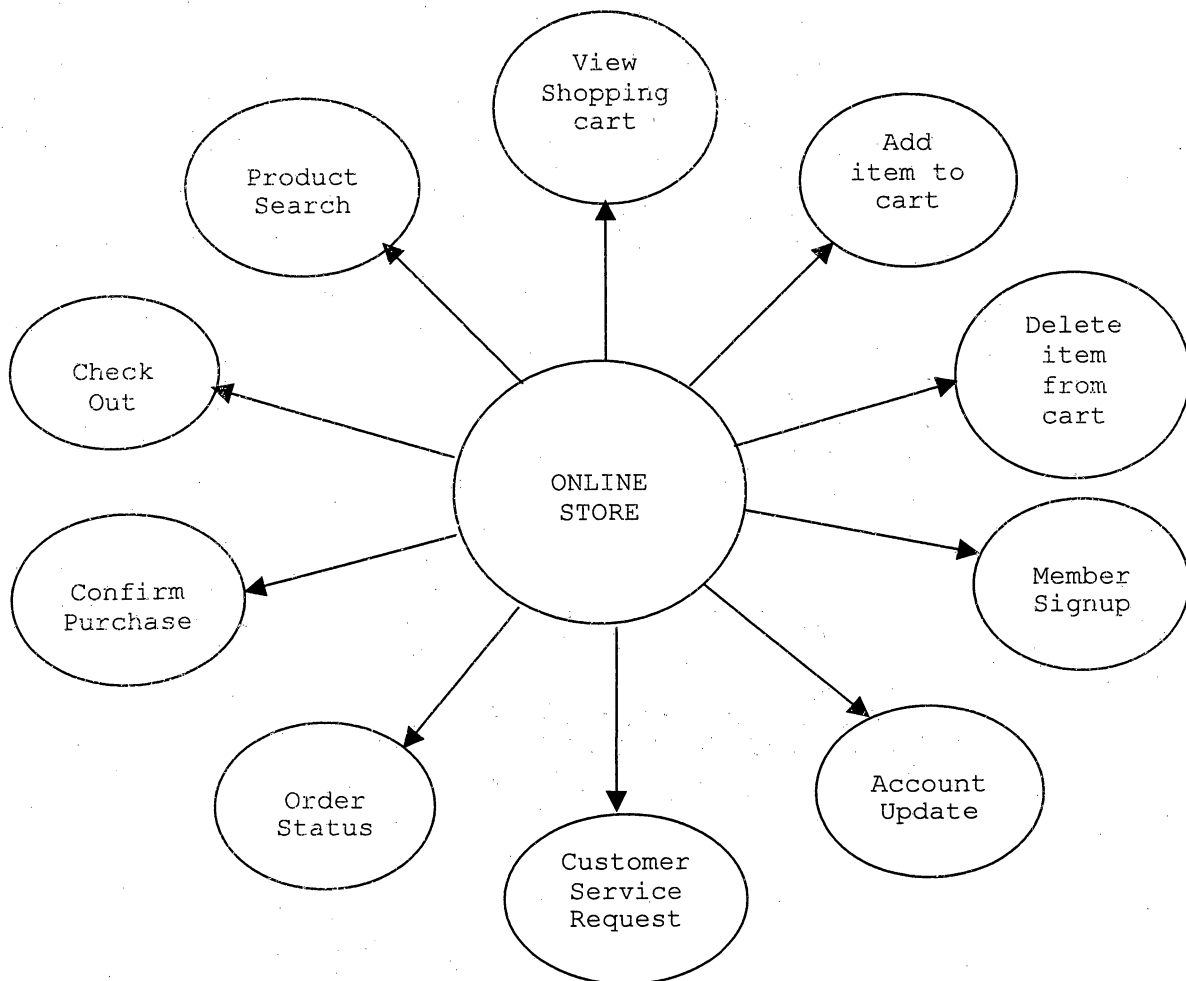


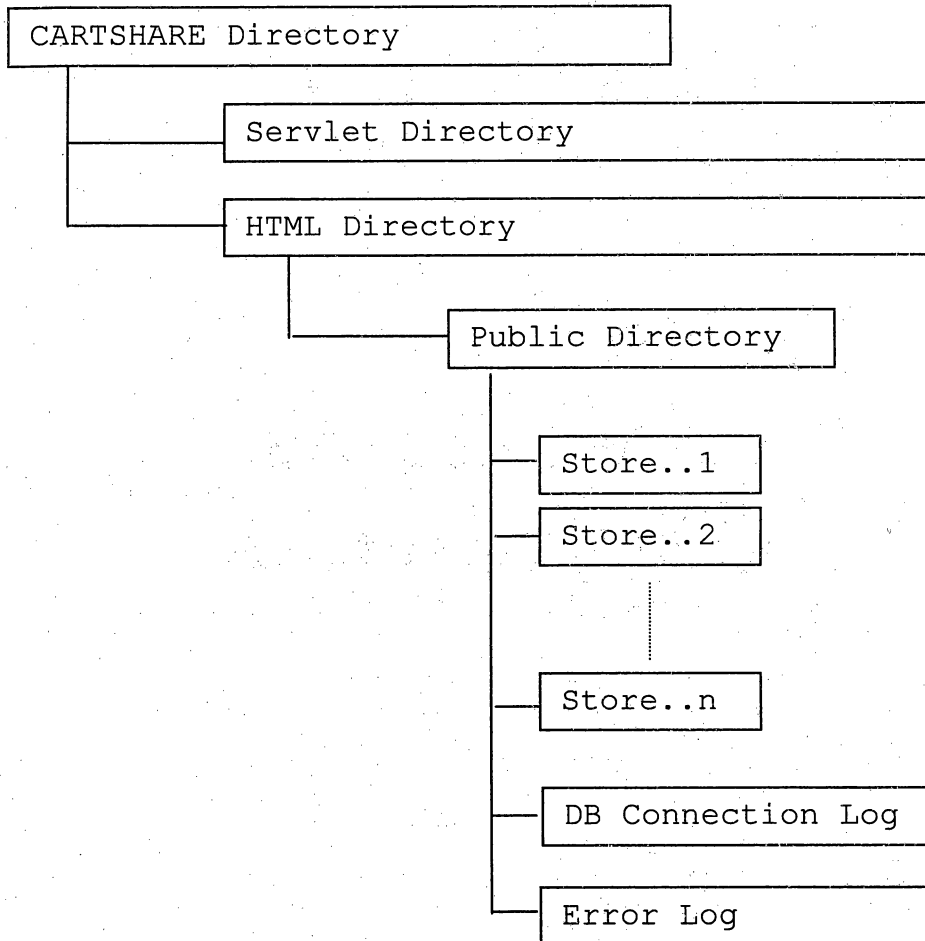
Figure 30. State Diagram for Store



### 1.6.3 Directory Structure

The following is a file and directory structure of CARTSHARE.

Figure 31. Directory Structure



#### 1.6.4 Database Design

This section shows the database design structure of CARTSHARE.

##### 1.6.4.1 Conceptual Model Diagram

Figure 32. Conceptual Model Diagram-1

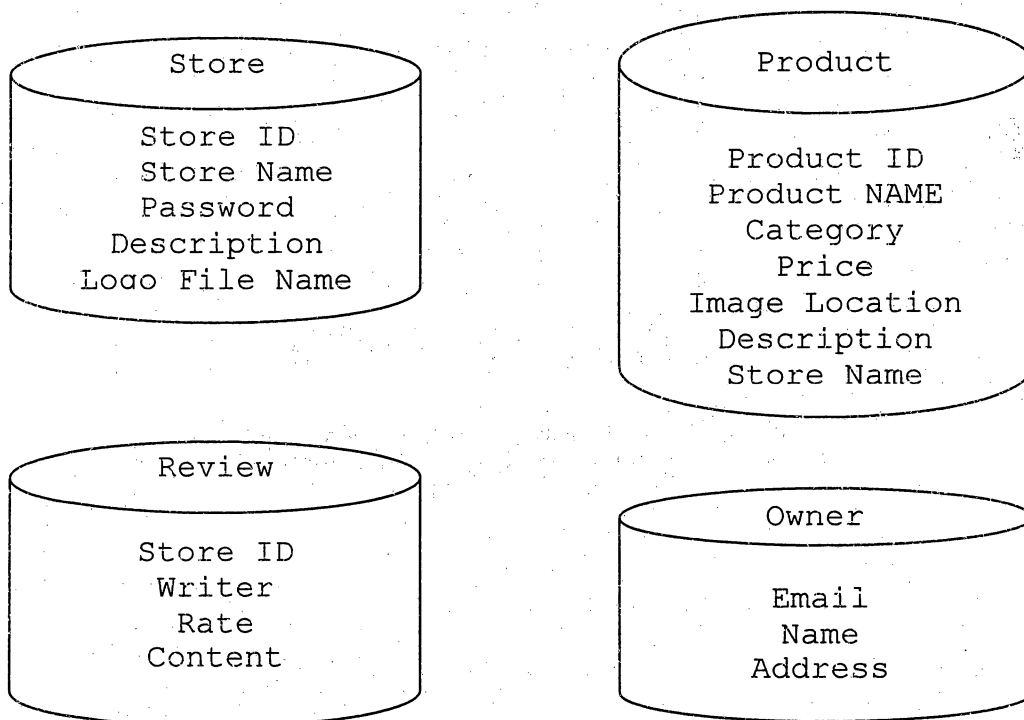
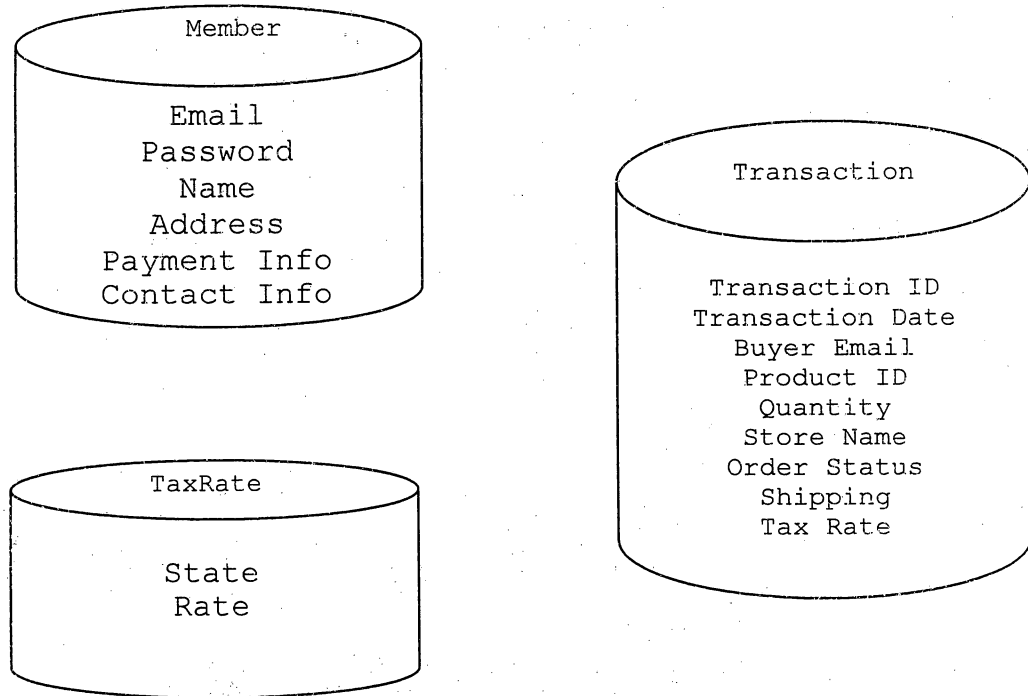


Figure 33. Conceptual Model Diagram-2



#### 1.6.4.2 Logical Model Table Schema

Each of the following shows a database table, description of attributes and examples.

Table Name: Member

Email: User's email address (text)

Password: User Password for login (password)

Fname: User's first name (text)

Lname: User's last name (text)

Street1: mailing address (text)

Street2: Extra mailing address (text)

City: City of mailing address (text)

State: State Abbr. of mailing address (text)

Zip: Zipcode of mailing address (text)

Phone: User's contact phone number (text)

Type: Type of Credit Card (text)

Num: Credit Card Number (text) (Encrypted)

Cdate: Expiration date of Credit Card (date)

Table 3. Database Table: Member

Email	Fname	Lname	Street1
ylee@csci.csusb.edu	Younik	Lee	5000 Univ. Parkway
tony@csci.csusb.edu	Tony	Kim	5000 Univ. Parkway

Street2	City	State	Zip
#1211	San Bernardino	CA	12345-1122
#2200	Irvine	AZ	21322-0099

Type	Num	Cdate	Phone
VISA	R!@WQDFEHGHTYUJU	09-01-2002	1-909-234-1122
DISCOVER	ADDCEERRRTSDGFGH	10-01-2002	1-949-132-0099

Table Name: Store

ID: Store ID generated by DB(int)

Sname: Store Name provided by User (text)

Password: Store Password provided by User(password)

Description: store description (text)

Logo: File name of store log image (text)

Table 4. Database Table: Store

ID	Sname	Password	Description	Logo
100	MyStore	*****	My store is...	Mystore.gif
101	yourStore	*****	Your Store is...	YouStore.gif

Table Name: Owner

ID: Store ID (int)

Email: Email Address of Storeowner (text)

Fname: First Name of Storeowner (text)

Lname: Last Name of Storeowner (text)

Addr1: Street name of Mailing Address

Addr2: Extra Street name of Mailing Address

City: City Name of Mailing Address

State: State Abbr. of Mailing Address

Zip: Zipcode of Mailing Address



Table 5. Database Table: Owner

ID	Email	Fname	Lname	Addr1
100	ylee@csci...	James	Lee	12332 River Dr.
101	jane@csci...	Howard	Kim	1010 San Mario ST.

Addr2	City	State	Zip
Apt #120	Foothill Ranch	CA	10020-0000
P.O. Box 10	Garden Grove	CA	11238-1111

Table Name: Product

ID: Product ID generated by DB (int)

Name: Name of Product(text)

(should be unique)

Category: Product Category(text)

Price: Price of Product(float)

Image: File Name of Product Image(text)

Description: Detailed Product Description(text)

SID: Store Id, which owns this Product(int)

Table 6. Database Table: Product

ID	Name	Category	Price
1000	Dell 1220	comp	1000.89

1001	Ping Golf Club	spor	534.67
------	----------------	------	--------

Image	Description	SID
Dell.gif	Dell 1220 is the best PC in ...	101
Ping.gif	This Club is graphite...	100

Table Name: Transaction

Tid: Transaction generated by DB (text)

Tdate: Transaction Date (date)

Email: Buyer's Email Address (text)

ID: Product ID (int)

Qt: Quantity of Item (int)

Status: Order Status (text)

Shipping: Shipping option (text) (0: Standard, 1: Next Day)

Taxrate: Applicable Tax Rate(float)

Sid: Store ID (int) (Seller ID)

Table 7. Database Table: Transaction

Tid	Tdate	Email	ID	Qt
20020	09-20-2000	ylee@csci.csusb...	260	1
20020	09-21-2000	kang@csci.csusb...	300	5

Status	Shipping	Taxrate	SID
COMPLETE	0	7.75	260
PENDING	1	10.15	300

Table Name: Tax

State: State Abbreviation (text)

Rate: Applicable Tax Rate (float)

Table 8. Database Table: Tax

State	Rate
AZ	6.25
CA	7.75

Table Name: Review

SID: Store ID (int)

Writer: The email of review writer (text)

Rate: Score Rating (int)

(only accept values -5 to 5)

Content: content of customer review (text)

Table 9. Database Table: Review

SID	Writer	Rate	Content
-----	--------	------	---------

100	ylee@csci...	5	This is the best store I've ever seen.
101	tony@csci...	-5	This is the worst store I've ever seen.

#### 1.6.4.3 SQL Commands

The following is a list of the SQL commands used in CARTSHARE implementation [13].

- CREATE DATABASE db
- DROP DATABASE db
- CREATE TABLE table (column datatype [,column datatype] ...)
- DROP TABLE table
- SELECT select\_list FROM table [WHERE conditions][ORDER BY column][ASC|DESC]
- INSERT [INTO] table VALUES (values\_list)
- DELETE FROM table [WHERE conditions]
- UPDATE table SET column = expr [,column = expr, ...]

### 1.7 Performance Requirements

#### 1.7.1 Reliability

The reliability of SHARE was verified via extensive testing of all features.

#### 1.7.2 Efficiency

Since this is an interactive program, the response time for the next display is very important. In order to make this product more efficient, Database Connection pool was used to reduce connection time from Java Servlet to the database.

### 1.7.3 Testability

Each requirement was identified and tested in the final product.

### 1.8 Exception Handling

Error messages are displayed on the browser and recorded on Error log file, which is specified on property file.

### 1.9 Conclusion

CARTSHARE offers various functions that make it easy to create and maintain online stores.

By sharing resources required to build an online store, the system provides an affordable E-commerce solution. It uses various mechanisms such as the HTML form based file upload, Database connection pooling, and user friendly GUI. It includes functionalities, which other existing store builders have.

The flexible design of CARTSHARE allows easy modification for transforming it to specific applications such as Online Auction.

CARTSHARE system is validated for its functionality and is ready for commercial use with Secure Socket Layer (SSL) [4].

#### 1.10 Proposed Future Development

1. CARTSHARE system uses one online store interface for all users. With several store interface template, users can customize and differentiate own store interfaces according to their tastes.
2. To guarantee a secure transaction, CARSHARE system should be installed on Secure Sock Layer (SSL) enabled web server.

#### 1.11 Acceptance Criteria

##### 1.11.1 Test Acceptance Criteria

The final product has met all requirements stated in this document (Section 1.6, Section 1.7). It was tested in conformance with the following test criteria.

##### 1.11.2 Unit Testing

The Unit testing focuses on the verification effort of the smallest unit of CARTSHARE system. The operation of

each function and GUI was tested and result of the tests are summarized in Table 1.1.1

Table 10. Unit Testing

Unit Tested	Test Performed	X
Store Creation	Tested for inserted values in DB Store directory created in public_html directory	X
Store Logo Add	Tested for logo image file exist in store directory Correct file name in DB	X
Product Addition	Tested for correct values in DB Product image file exist in designated directory	X
Product Modification	Product information is updated in DB Replaced image file exist	X
Product Deletion	Tested for removing product data from DB	X
Transaction report	Tested for valid transaction history	X
Transaction search	Tested for valid transaction data within range of date specified	X
Store Info	Tested for displaying correct store info to the browser	X
Store Update	Tested for updated values in DB	X
Member Signup	Tested for inserted values in DB Encryption for Password and Payment info	X
Order Status	Tested for displaying order history to the browser	X
Account Update	Tested for updated values in DB Encryption for Password and Payment info	X
Customer Service	Tested for sending description to store owner and customer	X
Show shopping cart	Tested for display valid product name and quantity	X
Update Quantity	Tested for updated value from quantity of specified item	X

Checkout	Tested for displaying customer info after user ID and Password was provided.	X
Confirmation	Tested for proper values in Transaction DB Order receipt by email	X
Product Search	Tested for related product list return with provided keyword	X

### 1.11.3 Integration Testing

The Integration testing focuses on the verification effort of the links between each functional page of CARTSHARE system. The Result of the tests is summarized in Table 10.

Table 11. Integration Testing

Role	User Input	Desired Output	X
Store owner	Click the Add a Product link	Display Product Addition page	X
	Click the Modify a Product link	Display the Modify a Product link	X
	Click the Delete a Product link	Display the Delete a Product link	X
	Click the All Transaction link	Display All Transaction report page	X
	Click the New Transaction link	Display New Transaction report page	X
	Click the Search Transaction link	Display Transaction search page	X
	Click the Store Update link	Display store information page to be modified	X
	Click the Add Store Logo link	Display Add Store Logo page	X



Customer	Click the Shop Category link	Display Product list page in specified category	X
	Click the See All Store link	Display Store list page	X
	Click the Shopping Cart link	Display Shopping cart page	X

	Click the New Member link	Display New Member Signup Page	X
	Click the User Account link	Display User Account login page	X
	Click the Order Status link	Display Order Status login page	X
	Type keyword in Search box and Click submit button	Display product list found with provided keyword	X
	Click the Customer Service link	Display Customer Service request page	X

#### 1.11.4 System Testing

In this phase of testing, CARTSHARE is tested as a site operator.

Table 12. System Testing

Unit Tested	Test Performed	X
Change Database system	Tested for changing DB user and password from system property file. Tested for changing DB name Tested for changing DB system name Tested for changing JDBC driver info	X
Log file for DB connection pool	Tested for changing log file location	X
Log file for system error	Tested for changing name and location of error log file	X

Payment Processing mode	Tested for changing payment processing mode	X
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## CHAPTER 2 : DETAILED DESIGN

This chapter presents the refinements of the architecture of CARTSHARE system. What follows is the description of each main function of CARTSHARE system. For each of the main function algorithm is given in pseudo language.

1. Function Name	Buy
Where Used	Shopping Cart
Purpose	Add an item to shopping cart
Subitems	
Note	

Procedure Buy

Begin

    If Method is GET

        Call DB Connection Broker

        Retrieve product information From DB

        Display product information

    Else Method is Post

        Call DB Connection Broker

        Retrieve Shopping Cart From Session

        If Same Product exist

            Update Quantity of the item

        Else

            Add Product to Shopping Cart

        End If

    Else

        Return Error Message

    End If

End

2. Function Name	ShowCart
Where Used	Shopping Cart
Purpose	Display contents of shopping cart
Subitems	
Note	

Procedure ShowCart

```

Begin
    If Method is GET
        Call DB Connection Broker
        Retrieve Product ID and Quantity
        Retrieve Product Info From DB
        Display list of products
    Else Method is Post
        Return Error Message
    End If
End

```

3. Function Name	UpdateCart
Where Used	Shopping Cart
Purpose	Update Quantity of Item
Subitems	
Note	

```

Procedure UpateCart
Begin
    If Method is POST
        Get Quantity
        If Quantity is 0
            Delete Item from cart
        Else
            Update Quantity of the item
        Else
            Return Error Message
        End If
    End If
End

```

4. Function Name	CheckOut
Where Used	Shopping Cart
Purpose	Proceed to place an purchase order
Subitems	Retrieve Customer Information
Note	

```

Procedure CheckOut
Begin
    Establish DB Connection
    Verify Email and Password From DB
    If Email and Password are valid
        Retrieve User Info
        Show Content of Shopping Cart
        Show the Button to Confirm Order
    End If
End

```

```

        Else
            Return Error Message
        End If
    End
End

```

5. Function Name	ConfirmOrder
Where Used	Shopping Cart
Purpose	Commit an purchase order
Subitems	Send order receipt by email
Note	

```

Procedure ConfirmOrder
Begin
    Establish DB Connection
    Retrieve User Info
    Show Content of Shopping Cart
    Insert Transaction Info to DB
    Send Order Receipt by Email
End

```

6. Function Name	CreateStore
Where Used	Store Builder
Purpose	Create new store
Subitems	Upload Store Logo Image
Note	Store Name should be unique

```

Procedure CreateStore
Begin
    Get Store Information from the browser
    Establish DB Connection
    If Store name exist
        Return Error Message
    Else If Store name is new
        Encrypt Password
        Generate Store ID
        Insert Store Info to DB
        Create Store Directory
    Else
        Display Error Message
    End If
End
End

```

7. Function Name	LoginToStoreManger
Where Used	Store Manger

Purpose	Load store manger page
Subitems	Insert Store ID TO Current Session
Note	

Procedure LoginToStoreManger

Begin

Get Store Name and Password

Establish DB Connection

Decrypt Password

If Store Name and Password are valid

Load Store Manager Page

Else

Return Error Message

End

8. Function Name	Add
Where Used	Store Manager
Purpose	Add a new Product to Store DB
Subitems	Check session validation
Note	

Procedure Add

Begin

Get Product Info

If Session has Store ID

Establish DB Connection

Insert product Info into DB

Show success Message

Else

Return Error Message

Go To Login Page

End if

End

9. Function Name	Retrieve
Where Used	Store Manager
Purpose	Display Product Information to be modified
Subitems	Check session validation
Note	

Procedure Retrieve

Begin

Get Product ID

```

    If Session has Store ID
        Establish DB Connection
        retrieve product Info From DB
        Display current product Info
    Else
        Return Error Message
        Go To Login Page
    End If
End

```

10. Function Name	Modify
Where Used	Store Manager
Purpose	Modify Product Information
Subitems	Check session validation
Note	

```

Procedure Modify
Begin
    Get Product Info
    If Session has Store ID
        Establish DB Connection
        Update product Info From DB
        Show success Message
    Else
        Return Error Message
        Go To Login Page
    End If
End

```

11. Function Name	Delete
Where Used	Store Manager
Purpose	Delete product From store
Subitems	Check session validation
Note	

```

Procedure Delete
Begin
    Get Product Id
    If Session has Store ID
        Establish DB Connection
        Delete product From DB
        Show success Message
    Else
        Display Error Message
    End If
End

```

End IF  
End

12. Function Name	List
Where Used	Store Manager
Purpose	Display list of product
Subitems	Check session validation
Note	

Procedure List  
Begin

```

Begin
  If Method is GET
    If Session has Store ID
      Establish DB Connection
      Retrieve product list within Store ID

      Display product list
    Else
      Display Error Message
    Else
      Display Error Message
  End IF
End
```

13. Function Name	Transaction
Where Used	Store Manager
Purpose	Display list of purchase history
Subitems	Check session validation
Note	

Procedure Transaction  
Begin

```

Establish DB Connection
IF Request Method is POST
  Get Order Date and Status
  Retrieve Data from DB
  Display list of Order and Status
Else Request Method is GET
  Get Order Status
  Retrieve Data from DB
  Display list of Order and Status
Else
  Display Error Message
```



End IF  
End

14. Function Name	Change
Where Used	Store Manager
Purpose	Update Order Status
Subitems	Check session validation
Note	

```

Procedure Change
Begin
    Establish DB Connection
    IF Request Method is POST
        Get Order Number
        Update Order Status From DB
        Display list of Order History
    Else
        Display Error Message
    End IF
End

```

15. Function Name	StoreInfo
Where Used	Store Manager
Purpose	Retrieve Store Info from Store DB
Subitems	Check session validation
Note	

```

Procedure StoreInfo
Procedure Delete
Begin
    If Session has Store ID
        Establish DB Connection
        Retrieve Store Info From DB
        Display Current Store Info
    Else
        Display Error Message
    End IF
End

```

16. Function Name	StoreUpdate
Where Used	Store Manager
Purpose	Update Store Information From DB
Subitems	Check session validation
Note	

Procedure StoreUpdate

Begin

    Begin

        If Method is POST

            If Session has Store ID

                Get New Store Info

                Establish DB Connection

                Update Store Info From DB

            Else

                Display Error Message

        Else

            Display Error Message

    End IF

End

17.Function Name	AddStoreLogo
Where Used	Store Manager
Purpose	Add or Change Store Logo Image
Subitems	Check session validation
Note	

Procedure AddStoreLogo

Begin

    Begin

        If Method is POST

            If Session has Store ID

                Get Image File

                Establish DB Connection

                Add or Update File name From DB

                Add or Replace Image file

            Else

                Display Error Message

        Else

            Display Error Message

    End IF

End

18.Function Name	CategoryList
Where Used	Main Page
Purpose	Display available product Categories
Subitems	
Note	

Procedure CategoryList

```

Begin
  Extract Request Method
  If Method is GET
    Get Store Name
    Establish DB Connection
    If Store Name is null
      Retrieve all product categories
    Else
      Retrieve categories within Store Name
    End If
    Display category list
  Else
    Display Error Message
  End IF
End

```

19.Function Name	Store
Where Used	Main Page
Purpose	Display product list
Subitems	
Note	

```

Procedure Store
Begin
  If Method is GET
    Get Category and Store Name
    Establish DB Connection
    If Store Name is null
      Retrieve products from all Store
    Else
      Retrieve products within Store Name
    End If
    Display product list
  Else
    Display Error Message
  End IF
End

```

20.Function Name	Detail
Where Used	Main Page
Purpose	Display product information in detail

Subitems	
Note	

#### Procedure Detail

Begin

    If Method is GET

        Get Product ID

        Establish DB Connection

        Retrieve product Info From DB

        Display product Information

    Else

        Display Error Message

    End IF

End

21.Function Name	Search
Where Used	Main Page
Purpose	Find a Product with provided keyword
Subitems	
Note	

#### Procedure Search

Begin

    If Method is POST

        Get Keyword

        Establish DB Connection

        Retrieve related products From DB

        Display product list

    Else

        Display Error Message

    End IF

End

22.Function Name	Signup
Where Used	Main Page
Purpose	Create new user account
Subitems	
Note	

#### Procedure Signup

Begin

    Establish DB Connection

    If Method is POST

        Extract User Info

```

        If User ID is Exist
            Display Error Message
        Else
            Encrypt Password
            Encrypt Credit Card Number
            Insert User Info into DB
        End If
    Else
        Display Error Message
    End If
End

```

23.Function Name	UserInfo
Where Used	Main Page
Purpose	Display User Account Info
Subitems	
Note	

```

Procedure UserInfo
Begin
    If Method is POST
        Establish DB Connection
        Extract User Info
        If Valid User ID and Password
            Retrieve User Info From DB
            Insert User Id into Session
        Else
            Display Error Message
        End If
    Else If Method is GET
        If Valid Session
            Get User ID
            Retrieve User Info From DB
        Else
            Display Error Message
            Go to Login Page
        End If
    Else
        Display Error Message
    End If
End

```

24.Function Name	UserUpdate
Where Used	Main Page

Purpose	Update User Infomation
Subitems	
Note	

Procedure UserUpdate

Begin

    If Method is POST

        Establish DB Connection

        Extract changed User Info

        If Session has User ID

            Insert changed User Info into DB

        Else

            Display Error Message

            Go to Login Page

        End If

    Else

        Display Error Message

    End If

End

25.Function Name	Order
Where Used	Main Page
Purpose	Display Order Status to Customer
Subitems	
Note	

Procedure Order

Begin

    If Method is POST

        Establish DB Connection

        Extract User Info

        If Valid User ID and Password

            Retrieve Order History From DB

            Display Order History List

        Else

            Display Error Message

        End If

    Else

        Display Error Message

    End If

End

26.Function Name	ForgotPassword
------------------	----------------

Where Used	Main Page
Purpose	Retrieve and send password by User ID
Subitems	
Note	

Procedure ForgotPassword

Begin

    If Method is POST

        Establish DB Connection

        Get User ID

        If User ID found in DB

            Retrieve Password From DB

            Decrypt Password

            Send Password to User Email

        Else

            Display Error Message

        End If

    Else

        Display Error Message

    End If

End

27.Function Name	Record
Where Used	Utility
Purpose	Record any run-time Error to file
Subitems	
Note	

Procedure Record

Begin

    Get Log file Location

    Open File Stream

    Record Date and Error Message

    Close File Stream

End

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